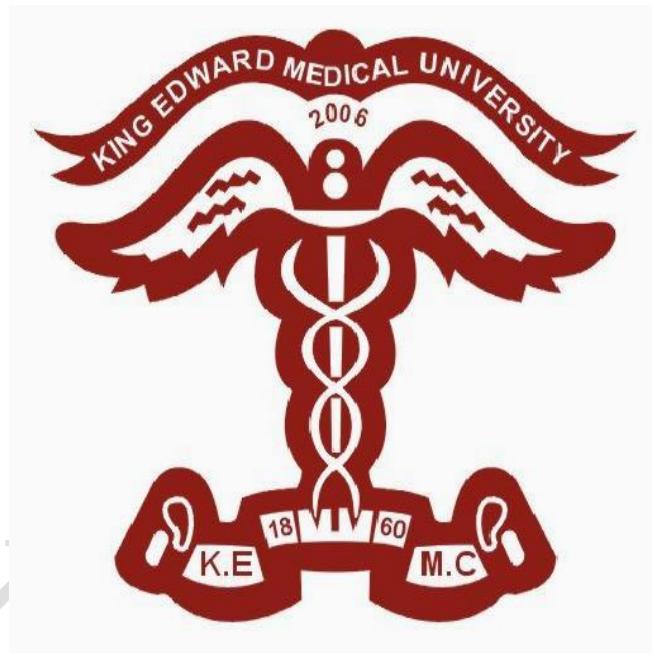


# **KEMU/MAYO HOSPITAL LAHORE PAEDS UNIT-II PROTOCOLS**



**KALIM**

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# **COMMON PAEDIATRIC DRUGS DOSES:**

## **ANTI-PYRETIC, ANALGESC, ANTI-INFLAMATORY..**

DRUG	Brand Name	Dose	Strength			Indications
Acetaminophen (paracetamol)	Calpol syrup. Panadol drops	10mg/kg/dose every 6 hours	Syrup 120mg,160mg/5ml	Tablet/Drops 80mg/ml, Tab 200,400mg	Injection	Antipyretic analgesic
Ibuprofen	Syrup.Brufen	10mg/kg/dose every 6 hours	100mg/5ml	*200mg *400mg		Antipyretic analgesic
DEXYBRUFIN	DEXY,TERCICA	10mg/kg/dose every 6 hours	100mg/5ml			Antipyretic analgesic
Aspirin	disprin	90-130mg/kg/day,6hrly		Tab.300mg		Anti-inflamatory
Nalbuphine	nalbine	0.1-0.2mg/kg/dose ,6hrly,IV,IM,SC	Inj 10-20/ml			
Diclofenac	Dicloran,voltran	>1-3mg/kg/day	Inj 75mg/3ml	Tab 50mg		
Morphine		0.15-0.2mg/kg/dose, IV,IM,SC	Inj 15mg/ml			
Pancuronium	Pavulon	60-100mcg/kg then 10-20mcg/kg/dose ,20-60mint	Inj 2mg/ml	Muscles relaxant	Used for	Intubation Only by seniors..
Baclofen	LioresaL, baclotab	10-15mg/day,8hrly For 3 days		Muscles relaxant		

## **ANTIEMETICS:**

Drug	Brand Name	dose	indications		
DIMENHYDRINATE	Inj./syrup.Gravinate	0.5mg/kg/dose every 6 hours	12mg/5ml		Antiemetic
Metoclopramide	Inj./syrup maxolon. Inj.metomide	0.2-0.5mg/kg/day every 6 hours	5mg/5ml	10mg	Antiemetic
Domperidone	Syrup.Peridone. Inj.motilium	0.5mg/kg/dose every 6 hours	5mg/5ml	10mg	Antiemetic
ONDANSETRON	Inj.tab Onset	0.15mg/kg/dose	2mg/ml	2, and 4mg	Chemoth- vomiting

## ANTIBIOTICS

### QUINOLONES:

drug	Brand Name	Dose	strength			indications
Ciprofloxacin	Syrup.novidat Tab.novidat. Syrup.Gavel. Syrup.Mytel	ORAL:20- 30mg/kg/day every 8-12hrs. I/V:4- 15mg/kg/day every 8-12hourz	*125mg/5ml *250mg/5ml	Tab.100mg ,250mg and ,500mg		Typhoid. UTI'S.
Nalidixic Acid	Susp.negram. Tab.negram	55mg/kg/day every 6 hourly	250mg/5ml	500mg		Lower UTI's

### CEPHALOSPORINS

Drug	Brand Name	Dose	indications		
1 <sup>st</sup> Generation					
Cephalexin	Ceporex	25-100mg/kg/day every 6 hrz.	*125mg/5ml *250mg/5ml	Drops:125mg/m 1	
Cephradine	Syp.velosef	50-100mg/kg/day every 6 hrz	*125mg/5ml. *250mg/5ml	250mg/vial. 500mg/vial.	
2 <sup>nd</sup> generations					
Cefaclor	Syp.ceclor	20-40mg/kg/day every 8 hrly	125mg/5ml. 250mg/5ml.	DROPS:125mg/ ml.	
Cefuroxime	Inj.zinacef Syp zecef	50-100mg/lg/day every 8hrly.	125mg/5ml, 250mg/5ml	250mg/vial. 750mg/vial.	
3 <sup>rd</sup> generations					
Ceftriaxone	Inj.Rocephin. Inj.oxidil. Inj.dayline. Inj.pathocef. Inj.titan	50-75 mg/kg/day every 12 hrly. Meningitis:100mg/kg/day every 12hrly.		250mg/vial. 500mg/vial. 1g/vial.	Liver toxicity
Cefotaxime	Inj.claforan. Inj.Yarker.	100-200mg/kg/day every 12hrly		250mg/vial 500mg/vial.1g/ vial.	Renal toxicity
Ceftazidime	Inj fortum	100-200mg/kg/day.8hrly			Anti pseudomonas
CEFIXIME	SYP.cefspan. Syp.caricef. Syp.cefidget. Syp.synocef. Syp.cef-od Syp.cefim.	10mg/kg/day in 12hrz.or 24hrz.	100mg/5ml. SD.200mg/5ml		
Amoxicillin	Syp.Amoxil. Syp.suprmax	20-40mg/kg/day every 8- 12hrz.	125mg/5ml. 250mg/5ml	Cap.250mg and 500mg	
Amoxicillin-clavulanate	Syp/inj.Augme ntin,Clamentin, co-clave.	20-45mg/kg/day every 8- 12hrs. 80-90mg/kg/day for otitis media.	156mg/5ml. DS syrup 312mg/5ml.	Tab 357mg,625mg,a nd 1.2gm	Amoxicillin-clavulanate
AMPICILLIN	Syp.inj Penbritin	100-300mg/kg/day every 8 hrly	125mg/5ml 250mg/5ml	125mg/5ml .250mg/5ml	Gram positive..
Metronidazole	Tab.,Syrup,Inj. Flagyl	35-50mg/kg/day every 8hrly	Syr.200mg/5ml	Tab 200mg,400mg	
Meropenem	Inj.meronem	60-120mg/kg/day,every 8hrly	500mg and 1Gm		
Vancomycin	Inj.vanco	40-60mg/kg/day, every 8hrly.	Inj:500mg/vial, 1g/vial.		Staph and resistan gram positive infections
AMIKACIN	Inj.gracil	7.5-10mg/kg, 8 hrly	25mg/ml,		

			250mg/ml		
Tazobactem+Piperacillin	Tanzo	150-300mg/kg/day,8hrly	2gm piperacillin		Nosocomial pneumonia
PENCILLIN-G	Inj.Benzyl-pencillin	1-4 lac/kg/day,6hrly	5-10 lac units/vial		Streptococcal infections
Benzathine Penicillin	Penidure LA, INJ Benzibiotic	6/12 lac unit IM,3WEEKLY	Inj 6/12 lac		Rheumatic fever prophylaxis
Clarithromycin	Susp Klaricid,pathocin,	7.5-15mg/kg/day,12hrly	125mg/5ml	Tab.500mg	IV INFUSION IN SALINE OVER 4 HR
Azithromycin	Syp Azit,zeenase	10mg/kg,OD,3days	200mg/5ml		
Artemether	Artem	3.2mg/kg IM state,then 1-6mg/kg ,OD,4days	Inj 40mg. Cap.80mg		malaria
Atremether+lumefantrine	Comether,qumental.arceva	3mg/kg/day	Syp.15mg/5ml		
Quinine sulfate		IV 10mg/kg loading over4 hr then same as 8hrly	Oral..double dose		Cerebral malaria.
Chloroquine	nivaquine	10mg/kg stat then 5mg/kg after 6 hr then 5mg/kg OD for 2days.	50mg/5ml	TaB 150MG	Prophylaxis,5mg/kg,once weekly.
		ANTITUBERCULOUS			
ISONIAZID	ISONEX	10-20mg/kg/day,OD	Syp50mg/5ml	Tab.100mg	Prophylaxis5-10mg/kg/day OD
RIFAMPICIN	Rimactane,rifdien	10/20mg/kg/day OD,1/2HR b4 Breakfast	Syp.100mg/5ml	Tab.300, 450mg	Nesseria carrier..10-20/kg/day OD,4days
PYRAZINAMIDE		15-30mg/kg/day,OD	Syp.250mg/5ml	500mg	
ETHAMBUTOL	myambutol	15-25mg/kg/day OD >5year		400mg	
STREPTOMYCIN	-	20-40mg/kg/day,OD,IM	Inj 1G		
Trimethprim+ sulfa methoxazole	septran	8-10mg/kg/day,12hrly UTI prophylaxis 2mg/kg ,OD	Syp TMP 40mg	Tab 100mg\ DS..200mg	PCP..10-20mg/kg/day UTI,BOILS
		ANTIVIRAL			
ACYCLOVIR	Zovirax,aclova	30mg/kg/day		Inj 250mg	Herpes simplex and varicella zoster
		ANTIHELMINTHICS			
MEBENDAZOLE	vermox	100mg,12hrly,3days >2yr children	Syp 100mg/5ml		antihelminthics
Albendazol	zental	200mg,single dose >2 yr children	100mg/5ml	Tab.200mg	antihelminjics
Levamisol	ketrax	2.5mg/kg ,single dose	40mg/5ml		antihelminthics

#### INOTROPIC AGENTS

DOPAMINE	Inj.Inotropin	5-15mcg/kg/min or 0.012*dose*weight	200mg/5ml	
DOBUTAMINE	Inj.Dobutrex	10-20mcg/kg/min 0.019*dose*weight	250mg/5ml	
DIGOXIN	LANOXIN	IV Digitilizing dose 0.10-0.30mg/kg divided in fractions or PO 0.04mg/kg divided in fractions as	Give half dose of total dose stat. Then 1/4 <sup>th</sup> 8hr later, Then 1/4 <sup>th</sup> 16hr later Then give 1/4 <sup>th</sup> as maintenance dose after 24 hr IV OR PO..	OR maintenance 0.1-0.015mg/kg/day 12hrly

Adrenaline	1:10000 sol..used	0,1ml/kg/dose IV 5mint upto 0.5ml/kg	Inj 1:1000, 1ml/1mg	Infusion 0,1-1ug/kg/min
Atropine		0.02mg/kg/dose		Sinus bradycardia and organophosphorus
		ANTIHYPERTENSION		
Propranolol	inderal	0.5-1mg/kg/day6-12hrly	TOF..0.15-0.25mg/kg/dose slow IV repeat after 15 mint. PO2mg/kg/day,6Hrly	
Nifedipine	Adalate	0.25-0.5mg/kg/dose PO,SL,6hrly	Tab.20mg	Cap.10mg
Methyldopa	aldomate	10mg/kg/day,6-12hrly upto65mg/kg/day	Inj50mg/ml,tab.250,500mg	
Captopril	Capoten,capase	0.5-0.6mg/kg/dose,6hrly Upto 6mg/kg/day		Tab12.5mg,25mg
Sodium Nitroprusside	Nipride	0.25-6ug/kg/min		
Diaxoxide	Hyperstat	IV 3-5mg/kg repeat aftr 15 mint	15mg/ml	
Hydralazine	aspresoline	0.15mg/kg/dose IV, Repeat 90 mint		
		ASTHMA		
Salbutamol	Ventoline	Oral0.2-0.4mg/kg/day,8hrly	Syp.2mg/5cc,sol.5mg/ml,	Nebulization 0.1-0.2mg/kg/dose
Aminophyline		5mg/kg IV ovr 20 mint.	Inj 250mg/10cc	
		Inhaler		
Beclomethasone	becotide	50-100mcg,2-4 times a day,MAX 10 puff daily	50ug/puff	
Salbutamol	ventoline	2 puff,2-4 times aday		
Fluticasone	flunisolide	4 puff aday		
		Nebulization		
Salbutamol	Resp. solution	0.1mg/kg/dose,1/2hrly	5mg/1cc	
Ipratropium	Atrovent2%	125-250ug/dose,4time daily		
Beclomethasone	Clenil-A	HALF vial ,BD		
		ANTICOAGULANTS		
Heparin		50unit/kg IV bolus,then infusion 10-25/kg/hr		Adjust according to APTT
Warfarin		0.1mg/kg/day PO,	Maintence 0.05-0.34mg/kgday,6hrly	Adjust according to PT
		DIURETCS..		
Manitol 20%		Diuretic.0.25mg/kg/dose in 15 min.	20gm/100ml	Cerebral edema.initial 0.5-1gm/kg/dose then.0.25-0.5mg/kg/dose
Acetazolamide	diamox	diuretic5mg/kg/dose,6-8hrly		
Frusemide	lasix	1-2mg/kg/dose, BD,TDS upto 6mg/kg.dose,	Inj 1ml/10mg,tab20,40mg	
Spironolactone	aldactone	1-3mg/kg/day,12hrly	25/100mg	
Naloxone		0.01-0.2mg/kg/dose,at 3mint interval	0.04mg/ml	Morphine poisoning

#### ANTICONVULSANTS/SEDATIVES:

DIAZEPAM	Inj. Valium	0.1-0.5mg/kg/dose. Commonly used:0.06cc*weight=...cc	Inj.10mg/2ml vial, Tab.2mg,5mg,10mg.	Fits/epilepsy
PHENOBARBITONE	Debritone,pheno	Loading:20mg/kg stat, Mainten.:4-8mg/kg/day every 12-24 hrs	Tab.30mg Syp.20mg/5ml Inj 200mg	Fits/epilepsy

MIDAZOLAM	Inj.Dormicum	0.5mg/kg/dose,every 5mint upto 5 time..max 0.6mg/kg	5mg/5ml	Infusion 0.1-0.2ug/kg/min
PHENYTOIN	DILANTIN	5-10mg/kg/day, BD	30mg/5ml	epilepsy
CLONAZEPAM	RIVOTERIL	0.01-0.03mg/kg/day,8hrly,increase 0.5mg/day for 3days upto 0.3mg/kg/day	Drops2.5mg/ml	epilepsy
Sodium valproate	Epival,epilim	10mg/kg/day,12hrly,increase5mg/kg/week upto 60mg/kg/day	250mg/5ml	epilepsy
LAMOTRIGINE	lamictal	2mg/kg/day,12hrly for 2week then 5hen 5mg/kg/day	Tab25,50,100mg	Adjuvant epilepsy
TOPIRAMATE	TOPAMAX	>2yr ..25mg at nite..then increase 1-3 weeks by 1-3mg/kg/day upto5mg/kg/day	Tab.25,50mg	Adjuvant epilepsy
CHLORAL HYDRATE		25mg/kg/dose,12hrly	250mg/5ml	sedative
	ANTIALLERGIC	AND STEROIDS		
Chlorpheniramine	Tab/Syp.Avil. Tab/Syp.Anti-el	1-2mg/kg/day every 6 hrz.or 1TSF for 10kg. <10kg ½ TSF. >10kg 2TSF.	15mg/5ml	22.7mg/2ml
Loratadine	Syp.Antial,loral	0.2-0.3mg/kg/dose,OD	5mg/5ml	Tab5mg
Cetrizine	Rigix,zyrtec	0.2-0.3mg/kg/dose,OD	5mg/5ml	10mg
Diphenhydramine	benadryl	4-6mg/kg/day,6hrly IV,PO	13.5mg/5ml	
Hydrocortisone	Inj.Solu cortef	Septic shock:35-50mg/kg/d,4-6hrly,	Acute asthma 5mg/kg/dose stat,1-2mg/kg/day 6hrly	100mg/2ml. 250mg/2ml. 500mg/4ml
Dexamethasone	decadron	Anti-inf..0.3mg/kg/day,6-12hrly, Meningitis..0.6mg/kg/day,6hrly for 4 days Cerebral edema..loading 1-2mg/kg/dose once then 0.2-0.5mg/kg/day,6hrly	4mg/ml.. Before Extubation.. 0.25mg-0.5mg/kg/day,8hrly	Tab 0.5mg
Prednisolone	Deltacortil	Asthma and asthma 1-2mg/kg/day, PO, NS..40-60mg/kg/day,8hrly	Tab 5mg	
Methyl Prednisolone	solumedrool	Acute asthma..2mg/kg/dose,6hrly. Acute spinal cord injury 30mg/kg in 15 mint folowed by 5mg/kg/hr for 23 hr.		Inj 40mg,125mg,500mg

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## **NEONATOLOGY PROTOCOLS:**

### **FLUID MANAGEMENT**

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Use the following as a guideline only. Be prepared to change it according to baby's hydration status (puffy or dehydrated), urine output, electrolytes and renal function (urea & creatinine).

Weight (Kg)	Age (d)	Total Fluids (ml/kg/d)	Fluid Type
< 1.5	1	90	plain 10% dextrose D10+1/5 <sup>th</sup> N Saline + 2ml KCL/ 100 ml
	2	110	(same)
	3	120	(same)
	4	140	(same)
	5	150	(same)
> 1.5	1	60	Plain 10 % dextrose D 10+1/5 <sup>th</sup> N Saline + 2ml KCL / 100ml
	2	80	(same)
	3	100	(same)
	4	110	(same)
	5	120	(same)

Check serum Na / K of all babies on alternate days when on IV fluids.

## ANTIBIOTIC POLICY

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### First line Antibiotics

- 1) Babies admitted directly from Maternities or Clinics
  - a) Ampicillin 50 mg/kg/dose 8 hourly
  - b) Cefotaxime 50 mg/kg/dose 12 hourly if age < 7 d  
8 hourly if age > 7 d
- 2) Babies admitted from Home
  - a) Ampicloxx 200mg/Kg/d in 3 doses
  - b) Cefotaxime as above

### Second Line Antibiotics

In the absence of culture report, select from following:

- a) Vancomycin 10 mg/kg dose 8 hourly as slow infusion.
- b) Amikacin 7.5 mg/kg/dose 12 hourly
- c) Cefipime 25mg/kg/dose 8 hourly
- d) Meropenem 20 mg/kg/dose 8 hourly as infusion

Start all antibiotics after taking blood cultures.

All antibiotics should be given IV.

## GUIDELINES FOR PHOTOTHERAPY AND EXCHANGE TRANSFUSION

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Weight (g)	Phototherapy (mg/dl)	Consider Exchange Transfusion (mg/dl)
500-1000	5-7	12-15
1000-1500	7-10	15-18
1500-2500	10-15	18-20
> 2500	> 15	> 20

- Use total bilirubin. Do not subtract direct bilirubin.
- Risk factors: hemolytic disease of NB, asphyxia, sepsis, hypothermia, acidosis, albumin below 3g/dl. If present, use lower levels.

### NORMAL HEMATOLOGICAL VALUES IN NEW BORN

	Pre-mature	Birth / term baby	D1	D3	D7	D14
1) HB (g/dl) (mean)	15	16.8	18.4	17.8	17	16.8
2) Retic Count (%)	3-10	3-7	3-7	1-3	0-1	0-1
3) White Cell Count (cumm)	5000-19000	10000-26000	13000-	5000-	5600-	6000-
4) Poly(X1000/cumm)	2-8	5-13	9-18	2-7	2-6	2-6
5) Platelets(cumm)	290000	290000	192000	213000	248000	252000

## ROUTINE PROTOCOLS AT ADMISSION IN NEONATAL SECTION

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- 1) Identify every baby from mother's or father's name. Fix two name tags as bracelets, along with Registration No: and Date of admission.
- 2) Secure photocopy of ID card of every baby's father / mother or near relative at admission and attach to patient's medical record.
- 2) Weigh every baby at admission, record weight in Grams.
- 3) Remove clothes and drape in clean open shirt and diapers.
- 4) Check vital signs: Temp, heart rate, respiratory rate and record in file.
- 5) Inspect Cord, apply spirit. If infected, paint with gentian violet 2%.
- 6) Clean Eyes with saline swabs separately for each eye.
- 7) Place in a cot or warmer or Incubator as needed. Cover with clothes unless exposure is needed.
- 8) Adjust Incubator temp: according to body weight, postnatal age and clothed or naked. Adjust Incubator temp (1kg=35-36C), (2 kg=34C) and (3 Kg=32 C)
- 9) Categorize every baby as LBW, Premature with gestation age, SGA, AGA or LgA.
- 10) Record Vital Signs (T,P,R) every 4 hours or 1-2 hourly to see trend if very sick.
- 11) Check Dextrostix reading at admission. If below 40 mg/dl, recheck every 1-2 hours.
- 12) Give 10% dextrose fluids IV to all babies if NPO, or give Enteral Feeding regularly.
- 13) Encourage Mothers to visit the baby to allow bonding, nursing care and feeding.
- 14) Encourage Breast Feeding on demand by manually expressed feeding by spoon, dropper or bottle,
- 15) Practice hand-washing on compulsory basis for all doctors, Nurses, paramedics and attendants. Do not practice drying with cotton towels. Dry in air or paper towels.
- 16) Limit Entry of Infected persons in the Nursery.
- 17) Isolate babies with Diarrhea, skin diseases or with MRSA colonization.
- 18) For security reasons, at the time of discharge, baby will be handed over to real parents after their identification by the duty doctor and charge nurse during office hours.

The parents will be asked to sign or fix thumb impression verified by Nurse.

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## NEONATAL ASPHYXIA

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### Evaluation

- 1) Apgar scoring if baby examined within 10 min of birth.
- 2) Neurologic evaluation (sensorium, tone, reflexes, convulsions, ant: fontanelle, eyeball deviation)
- 3) Signs of prematurity, IUGR, SGA, LGA
- 4) Skin : meconium staining, jaundice, bruising, cyanosis
- 5) Chest : (irregular, or shallow breathing, dyspnea with chest indrawing, crepts)
- 6) Physical birth trauma if any
- 7) CVS : (murmur, cardiac failure)

### Investigation

Blood sugar, CBC, Chest X-ray, ABG, Cranial USG, Cranial CT (if indicated)

### Management (post-delivery care)

- 1) Neutral thermal environment (warmer, incubator, wrapping in cot nursing)
- 2) Vital signs including BP and saturation
- 3) Oxygen therapy to prevent hypoxia
- 4) IV fluids D10 solution : 2/3 daily fluid requirement
- 5) Correct metabolic acidosis after ABG
- 6) NG aspiration
- 7) Vit K 1 mg IM stat
- 8) Phenobarbitone to treat convulsions (20mg/kg slow infusion; if refractory, use additional drugs, maintain with 5mg/kg in 2 doses).
- 9) Give antibiotic cover (Ampicillin+Cefotaxime) for possible sepsis.
- 10) Give Mannitol (5ml/kg/dose 8 hourly) if signs of raised ICP obvious, or brain edema documented on USG.
- 11) On recovery, give NG feeding in small amounts and increase gradually.  
Try oral feeds when reflexes present.

## NEONATAL SEPSIS

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### EVALUATION

- 1) Birth Events : Intrapartum maternal fever, prolonged rupture of membranes, CPR, chorioamnionitis, asphyxia, resuscitation, cord care
- 2) Feeding practices : BF / FF
- 3) Contact with infected persons
- 4) H/O Lethargy, poor feeding, grey look, fast breathing, hypothermia (cold hands / feet)
- 5) Systemic signs (GIT, Resp, CVS, CNS, Blood, Metabolic, Liver)

### INVESTIGATION

CBC, B:N ratio, Platelet count, CRP, ABG  
Blood culture, Chest X-ray, LP (if indicated)

### MANAGEMENT

- 1) Monitoring (TPR, BP, Saturation, Capillary refill time),
- 2) NPO, NG aspiration
- 3) Correct hypoglycemia if dextrostix  $< 40$  mg/dl. Give IV D10 2-4ml/kg as bolus, followed by D10 infusion.
- 4) Correct hypocalcemia if symptomatic or serum level  $< 7$  mg/dl, with calcium gluconate 10% 2ml/kg dose in infusion then add in daily fluids over 24 hours.
- 5) Maintain neutral thermal environment (incubator, warmer)
- 6) Maintenance fluids
- 7) Correct acidosis after ABG
- 8) If perfusion low (prolonged capillary refill), give IV push @ 20ml/kg then start Dopamine infusion 5-10 mcg/kg/min and/or add Dobutamine infusion 5-10 mcg/kg/min.
- 9) Correct anemia (Hb  $< 12.5$  gm/dl) with PCV 10 ml/kg, slowly over 2-3 hr.
  
- 10) Antibiotics as per guidelines
- 11) Feeding when tolerated, either via NG tube or give EBM or Formula feeds in increasing amounts.
- 12) Platelet transfusion if indicated

## PREMATURITY / LOW BIRTH WEIGHT BABY

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### EVALUATION

- 1) Estimate gestational age from Ballard's scoring between 24-72 hours; compare this to gestation expected from LMP. Birth weight. Categorize accordingly (SGA, AGA, LGA)
- 2) Birth events, PROM, chorioamnionitis, antenatal steroids
- 3) Feeding History
- 4) Vital Signs (TPR, Saturation, Capillary refill time)
- 5) Activity, hypothermia, fits, jaundice, cyanosis, malformation
- 6) Physical examination (CNS, Resp, CVS, Abdomen, renal, malformations)

### Investigation

CBC, Blood sugar, serum calcium, Chest X-ray, Cranial USG, blood culture

### MANAGEMENT

- 1) Maintain neutral thermal environment (use incubator, radiant warmer)
- 2) Monitor vital signs regularly
- 3) Vit K 1mg IM stat.
- 4) Give oxygen via nasal catheter (0.5-1 lit/min) or head box (4 lit/min). Keep saturation 90-95%.
- 5) Maintenance fluids D10 @ 80 ml/kg /d. Increase to 150 ml/kg/d at D5.
- 6) For suspected sepsis, take blood culture and start antibiotics empirically.
- 7) For poor perfusion (prolonged capillary refill time CRT > 3sec), give Dopamine infusion 5-10 microgram / kg/min.
- 8) In case of frequent apneas (duration > 20 sec, with bradycardia / hypoxemia), start **aminophylline** infusion 6 mg/kg/24 hr.
- 9) When stable, start feeding via NG tube (usually at 12-24 hr life). Even 1-2 ml milk will work as trophic feeds. If feeding reflexes are present, wt>1200 grams, gestation > 34 weeks and with no contraindication, start oral feeding via dropper/ spoon / feeding cup or soft nipple. Increase gradually, avoid vomiting / regurgitation.
- 10) Encourage mothers to visit their babies in the nursery. Involve them in routine care when possible. Encourage them to feed breast milk under guidance.
- 11) Monitor for complications

## NEONATAL HYPOGLYCEMIA

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### EVALUATION

- 1) Screen all sick neonates at the time of admission with the help of dextrostix. The special categories include preterms, low birth weight, SGA, IDM, babies with asphyxia, suspected sepsis and neonatal convulsions.
- 2) Recheck and confirm hypoglycemia by lab estimation of venous blood if initial reading below 40 mg/dl.
- 3) Suspect hypoglycemia in all high risk babies even when asymptomatic, symptoms of hypoglycemia like fits, sweating, pallor or drowsiness are very uncommon.

### Management

- 1) Give 10% dextrose 2-4 ml/kg IV bolus to correct hypoglycemia. Avoid hyperglycemia induced by giving 25% dextrose injections.
- 2) Start D10 IV infusion @ 80 ml/Kg/d and recheck blood glucose regularly to detect hypoglycemia.
- 3) Increase IV glucose infusion rate upto 150 ml/kg as required to keep blood glucose between 50-150mg/dl. Or increase IV glucose concentration to 12.5-15% via central line. Investigate further.
- 4) Use hydrocortisone or prednisone in refractory cases.
- 5) Start milk feeding regularly as early as condition permits. Encourage breast feeding frequently.

## INFANT OF DIABETIC MOTHERS

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### EVALUATION

- 1) Information about mother's diabetes status and treatment, obstetric history, h/o large babies previously, obstructed labour, symptoms of hypoglycemia
- 2) Birth weight, gestation, cyanosis, jitteriness or fits, birth trauma, encephalopathy, respiratory distress, congenital malformation
- 3) Screen all babies with dextrostix at birth or admission , then repeat at 1,2,3,6,12,24 and 48 hours. If low  $< 40\text{mg/dl}$ , treat hypoglycemia.
- 4) Initiate feeding early by formula feeds within  $\frac{1}{2}$  hour of life. Offer breast feeding early and frequently. Prevent hypothermia and keep warm.
- 5) Check CBC, hematocrit, serum calcium and bilirubin levels.
- 6) Anticipate special problems like respiratory distress syndrome, hypocalcemia, polycythemia, hyperbilirubinemia and congenital malformations of heart, spine and CNS, & GIT. Do detailed physical examination and get investigations like cranial USG, X- ray chest, echocardiography etc. These are managed accordingly.

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## NEONATAL TETANUS

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### EVALUATION

- 1) Features like feeding difficulty, generalized flexor spasms esp: on stimulus, abdominal guarding, locked jaw, opisthotonus, conscious state, infected umbilical wound, circumcision or pierced ear.
- 2) Ask birth events like mode and place of delivery and cord cutting practices by dais,
- 3) Check immunization of mother against tetanus.

### MANAGEMENT

- 1) Maintain airway by posture and gentle suction.
- 2) Avoid all stimuli. Keep in a noise free area with close monitoring.
- 3) Maintain IV line with D10 N/5 saline at usual maintenance.
- 4) Control fits with diazepam 0.3 mg/kg/dose slow over 1 min. Repeat dose 2-3 times if uncontrolled. If IV access not present, give diazepam per rectal in same dose after dilution with saline.
- 5) Antitetanus serum (ATS) 10,000 units IV stat without test dose. Or Tetanus immune globulin 500 units IM stat.
- 6) Give benzyl penicillin 200,000unit/kg/d in 3 doses IV, to control tetanus infection in the wound.
- 7) For suspected sepsis, give antibiotics (as above)
- 8) Clean wound / infected umbilicus with spirit and antiseptics like gentian violet or pyodine regularly.
- 9) In case of apnea, see if it is caused by spasm. Give diazepam to control it. If no spasm, then bag with oxygen or intubate.
- 10) Pass NG tube to remove secretions.
- 11) Give phenobarbitone 5-8 mg/kg/d in two dose alternating with diazepam 1mg/kg/d in two doses orally, for control of fits on regular basis. In case of further fits,  
give diazepam IV on PRN basis.
- 12) When fits under control, start feeding with NG tube using EBM or formula milk and increase gradually.

### The New Ballard Score

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### NEUROMUSCULAR MATURITY

SIGN	SCORE							SIGN
	-1	0	1	2	3	4	5	SCORE

Posture								
Square Window								
Arm Recoil								
Popliteal Angle								
Scarf Sign								
Heel To Ear								
TOTAL NEUROMUSCULAR SCORE								

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## PHYSICAL MATURITY

SIGN	SCORE							SIGN SCORE
	-1	0	1	2	3	4	5	
Skin	Sticky, friable, transparent	gelatinous, red, translucent	smooth pink, visible veins	superficial peeling &/or rash, few veins	cracking, pale areas, rare veins	parchment, deep cracking, no vessels	leathery, cracked, wrinkled	
Lanugo	none	sparse	abundant	thinning	bald areas	mostly bald		
Plantar Surface	heel-toe 40-50mm: -1 <40mm: -2	>50 mm no crease	faint red marks	anterior transverse crease only	creases ant. 2/3	creases over entire sole		
Breast	imperceptable	barely perceptible	flat areola no bud	stippled areola 1-2 mm bud	raised areola 3-4 mm bud	full areola 5-10 mm bud		
Eye / Ear	lids fused loosely: -1 tightly: -2	lids open pinna flat stays folded	sl. curved pinna; soft; slow recoil	well-curved pinna; soft but ready recoil	formed & firm instant recoil	thick cartilage ear stiff		
Genitals (Male)	scrotum flat, smooth	scrotum empty, faint rugae	testes in upper canal, rare rugae	testes descending, few rugae	testes down, good rugae	testes pendulous, deep rugae		
Genitals (Female)	clitoris prominent & labia flat	prominent clitoris & small labia minora	prominent clitoris & enlarging minora	majora & minora equally prominent	majora large, minora small	majora cover clitoris & minora		
TOTAL PHYSICAL MATURITY SCORE								

## MATURITY RATING

TOTAL SCORE (NEUROMUSCULAR + PHYSICAL)	WEEKS
-10	20
-5	22
0	24
5	26
10	28
15	30
20	32
25	34
30	36
35	38
40	40
45	42
50	44

### COMMON DISEASES PROTOCOLS:

#### PNEUMONIA

##### EVALUATION OF ARI CASE (cough and difficult breathing)

- Duration of symptoms
- Age (group as 0- 2 mo, 2-12 mo and 1-5 Y)
- Look for Danger signs: (classify as very severe disease)  
Above 2 months (fits, abnormally sleepy, unable to drink, stridor when calm, severe malnutrition)

Below 2 months (fits, abnormally sleepy, unable to drink, stridor, wheeze, grunting, cyanosis, high fever/hypothermia)

- Look for lower chest indrawings: classify as very severe pneumonia
- Look for fast breathing rate over one minute: classify as pneumonia
- None of the above: classify as No Pneumonia
- Ascertain the chest movement on both sides
- Percuss the chest wall in older children for hyper resonance/ stony dullness
- Auscultate for breath sounds, bronchial breathing, crepitations, wheezing and pleural rub
- Investigations like blood complete examination
- O2 Sat,
- Chest X ray PA view,
- ABG
- Blood for C/S

### MANAGEMENT

- Admit the patient
- Prop up posture (20°-30°)
- Expose and tepid water sponging to lower the temp:
- O2 inhalation @ 1-1.5l/min (if R/R is > 60 /min; clinical cyanosis, irritability, poor respiratory effort, O2 Sats < 88%).
- Vital signs including TPR x 4 hourly
- Maintain IV Line
- I/V Antibiotics

Age 0-2 months

Inj. Amikacin (15mg/kg/day IV in 2 DD +  
Inj. Cefotaxime (150mg/kg/day IV in 3 DD)

Age 02 – 24 months

Inj. Ampicillin (100mg/kg/day IV in 4 DD) +  
Inj Cefotaxime (100 mg/kg/day in 4 DD)

Age above 02 years

Inj. Benzyl – Penicillin 200,000 IU/kg/day I/V in 4 DD  
after test dose.

- Second line Antibiotics : Vancomycin, Klarithromycin, Cefipime, Meropenem. Consult seniors.
- Syp. Paracetamol (10-15 mg/kg/dose Q 6hr)
- If baby is very sick, keep NPO - give IV N/5 saline 100ml/kg/day
- Give frequent small feeds via NG (If tolerated)
- If baby dehydrated, give 50-100ml / kg of Ringer lactate in 6 hours.
- Chest Physiotherapy if needed
- If wheezing and spasm present, nebulize with ventolin solution 1-4 hourly.

## DIARRHEA & DEHYDRATION

### EVALUATION

- H/O diarrhea : duration, frequency, consistency, blood in stools
- Vomiting: duration, frequency, color, contents
- Associated symptoms: fever, cough, fits, rash, meningeal signs, urine amount, frequency, colour
- Feeding Practices: type of milk, complementary feeds, change made after onset of diarrhea/vomiting
- Vaccination status, H/O measles in last 3 months
- Wt, midarm circumference, length / height.
- Degree of PCM

	No Dehydration	Some Dehydration	Severe Dehydration
1.General Condition	Normal	Irritable	Floppy, unconscious
2.Eyes	Normal	Sunken	Very Sunken
3.Thirst	Normal	Eager	Unable to Drink
4.Skin Elasticity	Immediate recoil	Slowly	Very Slowly
Treatment Plan	A	B	C

### Treatment Plan C

- Maintain IV Line
- Give Ringer's lactate or normal saline (100ml/kg)
  - Infant (<1 Yr):  
30 ml/kg in one hour, then 70 ml/kg in next 5 hour
  - Children (1-5 years)  
30 ml/kg in one hour, then 70 ml/kg in next 2 ½ hour.  
If IV not accessed, then pass NG tube and give ORS 75 ml/kg over 4 hours. One may use intra-osseous route in emergency.
- Give ORS slowly with spoon (as soon as baby can drink)
- Continue feeding if possible (offer breast feeding)

- Reassess after rehydration.

#### Treatment Plan B

- Admit in emergency or ORT corner.
- Give ORS 75ml / kg in 4 hours slowly with spoon.  
Reassess after each hour
- Shift to plan C, if vomiting worsens, child is unable to drink or fails to rehydrate
- Discharge on plan A if re-hydration accomplished

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## Treatment Plan A

Continue feeding (breast feeding, yogurt, khichree, banana, dalya, banana shake, or rice cereal)

Give ORS ½ - 1 cup after each loose stool (according to age)

Return for followup clinic after two days & earlier if one of the following conditions occur:

- Diarrhea worsen
- Vomiting worsens
- Scanty urine,
- Unable to drink
- High grade fever
- Blood in stools,
- Fits,
- Abdominal distention

## Investigations

Not required in a simple diarrhea cases, only when indicated.

Hb, TLC, DLC,

Stool C/E, microscopy, pH, reducing sugar. & for isolation of Rota virus.

s/Na, K.,

Give zinc sulfate 10 mg OD orally for 10 days.

## Indications of Antibiotics

Dysentery, Cholera, Amebiasis, Giardiasis, clinical sepsis or neonatal diarrhea.

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TYPHOID FEVER.

## EVALUATION

- Fever: high grade continuous, remittent
- Diarrhea: constipation, less common
- Rash: salmon colored, maculopapular, blanchable, truncal rash of 1-4 cm size lesions that appear at the end of 1<sup>st</sup> week & disappear in 2-3 days
- Toxicity, Anorexia ,Wt loss
- Abdominal pain, distention (hepatosplenomegaly
- Intestinal hemorrhage: (hematemesis, melena)
- Perforation (distention, bilious vomiting, absent bowel sounds, pneumoperitoneum)
- Encephalopathy (apathy, confusion, psychosis, chorea.
- Cholecystitis

## LAB WORK

- Hb, TLC, DLC, Platelets, ESR

**PAEDS UNIT-II PROTOCOLS BY DR KALIM, DR TAUSIF DR SUHAIL AND DR UMMER**

- Blood culture (40-60% positive)
- Urine & Stool culture
- CXR, X-Ray plain abdomen,
- Widal test has poor sensitivity / specificity (only supportive)

## MANAGEMENT

- Admit the patient (Persistent Fever, Poor intake, drowsiness, fits, extreme toxicity )
- Maintain IV Line.
- Record TPR x 4 hourly.
- Expose to lower Temperature.
- Syp. Paracetamol (15mg/kg/dose 4-6 hourly) or ibuprofen (10mg/kg/dose) 6-8 hourly
- IV fluids: correct Dehydration with deficit therapy and then give 100% maintenance as 5% dextrose / N/5 saline.
- Start Antibiotics.
  - Inj. Ciprofloxacin (15mg/kg/dose IV x 12 hourly for 10 days if age > 8 y).
  - Inj. Ceftriaxone 50mg/kg/dose IV x 12 hourly for 10-14 days
  - Start steroids if patient very toxic, has encephalopathy or impending perforation, (Inj. dexamethasone 3mg /kg IV stat , 1mg/ kg IV 6 hourly for 02 days
- Surgical opinion for abdominal complications like perforation, peritonitis, & cholecystitis

## ACUTE BACTERIAL MENINGITIS..

## EVALUATION

- Fever, headache, vomiting
- Irritability, excessive crying, feed refusal
- Diplopia, photophobia
- Disorientation, fits, loss of consciousness
- Skin rash, contact with a case of meningitis.
- Vital signs (bradycardia,  $T^0$ , BP, ↑breathing pattern, fundoscopy)
- SOMI (neck stiffness, Kernig's & Brudzinski's signs)
- Sensorium: irritability, drowsiness, coma,
- Ant.fontenelle, OFC
- Tone, reflexes, focal signs
- Rash: petechial, purpuric

- Fundoscopy

## LAB WORK

- Hb, TLC, DLC
- CSF: appearance, pressure, glucose, proteins, cytology- total & differential, smear, culture ( exclude ↑ICP, bleeding diathesis, local infection, focal signs)
- Blood C/S
- s/Na, K
- Cranial USG
- CT brain (plain & with contrast)

## MANAGEMENT

- Admit the patient
- Maintain IV Line.
- Pass NG Tube & aspirate gastric contents if unconscious.
- TPR x 4 hourly.
- Keep input output record.
- Expose to Control Temperature.
- Syp. Paracetamol 10-15 mg/kg/ 6 hourly via NG tube or orally.
- For children < 01 year, daily OFC.
- Keep in left lateral position with head slightly down during fits.
- Give IV fluids (60-70% of maintenance N/5 saline if patient is unable to drink)
- Start Antibiotics.
  - For Age 1 month up to 2 Years:-
  - Inj. Ampicillin (75 mg/kg/dose) IV x 6 hourly for 10-14 days
  - Inj. Cefotaxime (50 mg/kg/dose) IV x 6 hourly for 10-14 days
  - Inj. Dexamethasone,(0.2 mg/kg/dose x 6 hourly for 3 days)

### For Age above 2 Years:-

- Inj. Benzyl-Penicillin (100,000 units/kg/dose) x 6 hourly ATD for 10 days
- Inj. Cefotaxime (50mg/kg/day) IVx 6 hourly for 10 days
- Inj. Dexamethasone,(0.2 mg/kg/dose x 6 hourly for 3 days)
- (Tailor treatment with C/S report when available)
- (Consult senior before switching to 2<sup>nd</sup> line drugs)

- Control of Fits:-
  - Inj. Diazepam (0.3 mg/kg/dose) IV SOS (may be repeated 3 times at 5 minutes interval)
  - Inj. Midazolam, 0.15 mg/kg IV stat. Midazolin infusion may be needed
  - Inj. Phenytoin, 15 -20 mg/kg IV stat
- ⇒ For Further Control:-
 

Load with Inj./Tab. Phenobarbitone 10 mg /kg--- IV/ NG  
then Tab. Phenobarbitone 5mg/kg/day via NG/Oral.
- Observe for Early Complications
  - ICP: ( $\uparrow$  B.P, bradycardia, bradypnea, Papilledema,  $6^{\text{th}}$  nerve palsy, tense fontanella)  
Raise head end by 20-30°  
Restrict IV fluids, 60-70% of daily maintenance  
Inj. Mannitol,  $\frac{1}{2}$ -1 Gm (5-10ml) IV x 8 hourly  
Inj. Dexamethosone 0.6mg/kg/day x IV x 8 hourly.  
Keep bladder & bowel empty  
Hyperventilate
  - SIADH: Continued fits, coma, S.Na <130mEq/L;  $\downarrow$ S. osmolility,  $\downarrow$ urine vol,  $\uparrow$ urine osmolality/ sp.gravity  
Restrict IV fluids: 50% of maintenance
  - Adrenal Crises with Shock: Collapse, low BP, petechial rash  
Normal Saline, 20 ml/kg IV over 10-20 min  
Hydrocortisone, 20mg/kg x stat; then 6 hourly
  - Subdural Effusion:  $\uparrow$ Coma,  $\uparrow$ fits,  $\uparrow$ OFC, recurrence of fever, Cranial USG & CT Brain  
Aspiration on both sides (involve neurosurgeon)

ANEMIA...

## EVALUATION

- Age of onset
- Sex
- Family H/O hemolytic anemia, neonatal jaundice, exchange transfusion, cholelithiasis, cholecystectomy
- Nutritional History: Pica, Vegan diet, intake of goat's milk,
- H/O Drug intake: Antimalarials, phenytoin, penicillins, cytotoxic drugs
- H/O Chronic Diarrhea (Celiac, intestinal resection, IBD, CMP allergy)
- H/O worm infestation
- Pallor, listlessness, effort intolerance
- Behavioral problems, irritability
- WT, Ht, OFC, MUAC
- Dysmorphism
- Pallor in palms, nails, conjunctiva, mucous membranes

- Jaundice, LN, Liver, Spleen
- Tachycardia, gallop, systolic murmur
- Signs of systemic disease (edema, joint pains)

## LAB WORK

- Hb, TLC, DLC, platelet count, reticulocyte count, RBC morphology
- PCV, MCV, MCH, MCHC
- S/ iron, TIBC, Ferritin
- Hb F, Hb electrophoresis
- S. creatinin, bilirubin, ANA, folate & B<sub>12</sub> levels
- Stool C/E & occult blood
- Coomb's test, osmotic fragility test
- Bone marrow aspiration / trephine biopsy

## MANAGEMENT

- Admit the Patient.
- Maintain I/V line
- Send investigations.
  - Hb, TLC, DLC, Platelet & Reticulocyte Counts.
  - RBC and WBC morphology by the hematologist in the morning hours
  - (make slide if transfused in emergency)
  - If urgent investigations not possible, save 5ml heparinized and 5ml non-heparinized blood in refrigerator.
- Get Hb done on urgent basis. If
  - Hb level < 4g% → transfuse the patient in emergency even if without signs and symptoms of CCF.
  - If Hb level 4-6g% → transfuse only if CCF present.
  - If Hb level > 6g% → wait for investigations (usually do not require transfusion on urgent basis)
  - If Transfusion is Required:-
    - Save 5 ml of heparinized and non heparinized blood sample each.
    - Send blood for grouping & cross matching & screening,
    - Sign grouping, cross matching the screening card from the blood bank
    - Transfuse 10ml /kg of packed cell transfusion over 2-3 hours
    - Inj. Lasix 1 mg/kg- IV before transfusion in severely anemic patients & mid transfusion in others
    - Complete transfusion in 4 hour. (keep adrenaline, hydrocortisone, avil and paracetamol at hand.)
    - Stop transfusion if fever with shivering occurs. Give IV Inj. avil ½ -1ml & Hydrocortisone 20 mg/kg stat. Get the blood re-cross-matched.

Restart Blood after lowering the temperature. Discard the blood if fever occurs again. Discard if the bag remains open for more than 4 hours.

## Tuberculosis

### Evaluation

- H/O Fever > 2 weeks, weight loss, cough > 2 weeks, night sweats,
- H/O contact with a case of tuberculosis (esp: family contact)
- H/O measles, whooping cough or steroid intake in recent past
- BCG vaccination status
- Examination : malnutrition, unresolved pneumonia, pleural effusion, ascites, enlarged, matted lymph nodes, signs of meningeal irritation, focal neurologic signs
- Blood complete exam, ESR
- Radiograph chest : primary complex, hilar / mediastinal lymph node enlargement, effusion, miliary shadows.
- Mantoux test 10mm or more at 72 hours
- Accelerated BCG response 10 mm or more within 72 hrs
- Pleural / abdominal aspirate : exudative with raised proteins , low sugar and cellular infiltrate with lymphocytic predominance
- Lumbar puncture with CSF proteins > 40mg/dl, low sugar (< 50% blood sugar) and cellular infiltrate (> 5 WBC/cumm) with lymphocytic predominance
- Gastric aspirate after overnight fast / Sputum for AFB
- FNA and / or biopsy of lymph nodes

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## SCORING METHOD FOR DIAGNOSIS

Features	1	2	3	4	5	Score
<b>HISTORY</b>						
Age	<2 yrs	-	-	-	-	-
Close contact in last 2 years	With TB patient		With sputum +ve TB patient			
BCG scar	Absent	-				
History of measles and whooping cough	Between 3-6 months	<3 months				
Immunocompromise/Immunosuppressant*	Yes	-				
PCM grade 3	Yes	-	Not improving			
<b>EXAMINATION AND INVESTIGATION</b>						
Physical examination §	-	Suggestive of TB		Strongly suggestive		
Radiological Findings ¶	Non specific	Suggestive of TB				
Tuberculin skin Test	5-10 mm		>10mm			
Granuloma	Nonspecific			Specific for TB		
<b>TOTAL SCORE</b>						

## INTERPRETATION

### Management

- Treat according to stage of disease
- Stage I
  - No symptoms, No signs, only H/O contact, Chest X-ray negative, age below 3 years and/or h/o recent Mantoux positivity  
INH 10 mg/kg/d + Rifampicin 15 mg/kg/d  
Give for 6 months
  - Stage II  
Patient symptomatic, Mantoux +, Chest X-ray Normal

INH 10 mg/kg/d + Rifampicin 15 mg/kg/d

Give for 9 months

- Stage III

Patient symptomatic, Mantoux test +, Chest, abdominal, lymph nodes involvement

RIF+INH as above +Pyrazinamide 30 mg/kg/d after meals

Then withdraw PZI after 2 months and continue 2 drugs for total 9 months

- Stage IV

TBM and Miliary TB

RIF, INH+PZI as above + Myambutol 25 mg/kg/d

Withdraw PZI and MYM after 2 months and continue rest for one year.

Add PDN 2 mg/kg/d for 2-3 weeks.

## SHOCK

Acute progressive syndrome with generalized inadequate perfusion and oxygen supply to fulfill metabolic demands. This is caused by either depletion of fluids, poor cardiac contractility or vasomotor imbalance. Initially the condition is compensated by body's sympathetic response, but later on may become decompensated with multi-organ failure.

### Evaluation

- H/o fluid loss like diarrhea, vomiting, burns, blood loss, polyuria, exposure to heat, reduced intake, congenital heart disease, infection, anaphylaxis, surgery
- Anxious look, pallor, air hunger, sweating, irritability, drowsiness / coma, tachycardia, tachypnea, dry mucosa, cold extremities, mottling, prolonged capillary refill time > 3 sec, petechiae/ hemorrhagic rash.
- Low urine output. BP stable initially, then starts falling.
- Hepatomegaly, cardiomegaly and signs of CCF if cardiogenic shock due to arrhythmia or myocarditis.
- Gallop rhythm, sinus tachycardia
- CBC, blood sugar, s/Ca, Na, Cl, ABG
- Chest X-ray, blood culture,

### Management

- Admit in ICU or intensive care area within emergency / ward.
- Vital signs monitoring (TPR, BP, Saturation), capillary refill time
- Strict intake output measurement including daily weight. Catheterize bladder if required
- Stabilize Airway, Breathing, Circulation and Dextrose.
- Maintain airway by posture or airway insertion. Elevate foot end to improve circulation to vital organs.
- Insert two IV lines.
- Keep NPO. Aspirate stomach with NG tube.
- Keep warm. Use radiant heaters.

- Give Oxygen via nasal cannula, mask or head box. Correct hypoxia. May need intubation / ventilation.
- If hypovolemic shock, give 20 ml/kg Normal saline / Ringer Lactate as rapid push over 15 min. For refractory cases, repeat the same infusion two more times. Complete deficit therapy with total fluids 100 ml/kg over 4 hours.
- Correct Hypoglycemia (D10 2-4 ml/kg) and hypocalcemia (1-2 ml/kg calcium gluconate slow and dilute) as they frequently accompany shock in young infants.
- In refractory cases, give colloids like blood, plasma 10-20 ml/kg, Hemacel or salt free albumin 1-2 gm/kg slow
- Correct metabolic acidosis with sodium bicarb 1-2 ml/kg slow and dilute. Do blood gases, calculate base deficit and correct accordingly.
- Give Inotropic support like Dopamine 5-10 micro gm/kg/min and Dobutamine 10-20 micro gm/kg/min for cardiac support.
- Give steroids in the form of Hydrocortisone in stress doses or methyl prednisone IV (30 mg/kg)
- If shock is advanced and / or refractory, assess other systems (renal, cardiac, coagulation. GIT, respiration, metabolic) and manage for multiorgan failure. Consult seniors.

Status Asthamaticus..

Definition: severe exacerbation of asthma that dose not improve with standard therapy

- 1- Admit the patient in ICU
- 2- Enquire about history of

Evaluate+Assess

- a) Known Asthmatic, or first episode
- b) Treatment receiving as bronchodilators, steroids inhalers, Oral steroids, nsails
- c) History of Fever, Rhinahoe Cough
- d) Exacerbating –factors ,exposure to drugs, allergens, smoke
- e) Previous admissions in emergency

I/V fluids

General conditions of the patient, conscious, able to talk, audible wheeze cyanosis, silent chest.

- 2- O2 inhalation
- 3- Nebulization  
(Send samples)(Investigation)

PFR:

CXR:

ABG: Resp Audosis, Resp Alkalosis  
Repeat

CBC:

4- Ventolin: Nebulization + O<sub>2</sub> age <1 Year

AGE < 1 YEAR ventolin solution 0.25+ 2.5 cc normal saline

AGE >1 YEAR ventolin solution 0.50 + 0.5cc normal saline

Nebulize ½ hourly x 3 times

If patient does not improve then nebulize continuously

5- Ipartropium

Nebulization 0.5 mg / 2.5 ml x 2---4 hourly

6- Inj Epinephrine 0.05 mg s/c

7- Magnesium Sulfate

25-75 mg / kg

Max 2.5 g 1/V20

8- Methyl Xanthine

9- Terbutaline Sulfate

If persistent acidosis O<sub>2</sub> Saturation not improving

10- Start Ambu Bag and Mask

Endotracheal Intubation

Status Epilepticus;

Continuous Convulsions lasting longer than 20-30 minutes or occurrence of serial convulsion between which there is no return of consciousness

Evaluation

Generalized: Tonic clonic seizures predominate.

Assessment of Vital Signs (pulse, temperature, blood pressure, heart rate, breathing pattern, Conscious Level)

Enquire about Drug Intake / Medicines used

Check for patent Oral Airway and secure it

Gentle Suction for Oral SECRETIONS

Properly fitting Mask attached to Oxygen is applied. If the patient does not respond to Oxygen by mask, then ventilate by Ambu Bag. Assist Ventilation.

PASS N/G Tube  
Pass I/V line  
Send the following investigations  
Check blood glucose and start I/V Dextrose

CBC            S/E            BSR

Ca,P. Magnesium

ABG's -----

Physical + Neurologic Exam  
Papilledema, Evidence of Trauma Retinal hemorrhages  
Pulse Oximeter

Note the Breathing pattern, central breathing

Management

PASS N/G Tube  
Pass I/V line

Drugs:

I/vinjection Diazepam

Midazolam

I/V 0.1-0.3 mg / kg (mg / min)

Repeat 3 doses: it can also be given if i/v assess not achieved

Diazepam            (Rectal gel)  
                          0.3-0.5 mg / kg

Watch for respiratory depression  
if fits persist then i/v midazolam infusion started  
(Buccal or nasal midazolam.)

Monitor for Respiratory depression or Hypotension

inj	Phenytoin	15-30 mg / kg (1 mg / kg / min)
	Fosphenytoin	ECG
	Midazolam	Propofol
	0.20 mg / kg	1-2 mg / kg
	20-400 mg / lg / hr	2-10 mg / lg / hr

If fits persist then  
Barbiturate Coma:monitor    EEG for 48 hours

Thiopental 2-4 mg / kg

Burst suppression on EEG

Serum phenobarbital levels watch for hypertension

Valproic Acid (10-15 mg / kg)

Paraldehyde

1.75 ml (1g / ml) + 5% D/W

Total 35 ml

Paraldehyde

150-200 mg / kg

Load

Slowly 15-20 min

Paraldehyde is given by Glass Bottle infusion @ 20mg/kg/hour in a freshly opened preparation, outdated paraldehyde may deteriorate to acetaldehyde and acetic acid.

GENERAL ANAESTHESIA

HALOTHANE / ISO FLUARANE

Fulminant Hepatic failure..

Clinical syndrome resulting from massive necrosis of hepatocytes or from severe functional impairment of hepatocytes Synthetic, excretory, detoxifying functions of the liver are all severely impaired  
Hepatic Encephalopathy has been an essential diagnostic feature (difficult to detect early in infants and children)

1- Biochemical evidence of acute liver injury

< 8 wk duration

2- No evidence of chronic liver disease

Evaluate

History of fever, JAUNDICE, Drugs, Halothane, Sodium Valporate, HAV, HBV, EB, Herps Simplex

CCF, CCF, Cyanotic CHD Heart Disease

Wilson disease, inborn errors of metabolism, history of phosphorus intake

Progressive Jaundice

Inquire about history of the symptoms

Anorexia, Vomiting, Abdominal pain, Irritability, Poor feeding, Change in sleep rhythm, Somnolent, confused, combative on arousal + Responsive only to painful -----

Fetor Hepatitis fits,

A progressive decrease in liver size without clinical improvement is an ominous sign.

**PAEDS UNIT-II PROTOCOLS BY DR KALIM, DR TAUSIF DR SUHAIL AND DR UMMER**

### Examination

patients conscious level, vital signs .jaundice, fetar hepaticus, spider angiomas , ascites, liver and spleen enlargement, oedema, type of respiration, neurologic examination.

### Fundus examination

### Send investigations

CBC -----

Bilirubin      Direct / Indirect

AST GGT    AST

ALKALINE PHOSPHATASE

Serum      NH3      Na, K, Creatinine

PT: APTT

Blood sugar

Abd.Ultrasound

ABG's

### Management

I/V Fluids

Pass N/G      if patient is unconscious or delerious

Avoid Sedatives

H2 : Receptor blockers-----

For Hypovolemia:      I/V10% dextrose water according to body weight 70% of

Maintance + potassium

Phosphorus and magnesium supplementation in case of deficiency.

Inj Vitamin K

Fresh Frozen Plasma

Platelets

Plasma pheresis: may ----- temporary correction of bleeding diathesis without resulting in volume overload.

Recombinant factor VII a

Central line:      Intracranial pressure monitor

Continuous Hemofiltration

Monitor for infection including Sepsis, Pneumonia, and UTI

Avoid Infection, Constipation, hypokalemia, GIT hemorrhage can precipitate Encephalopathy and should be identified and corrected

Protein Intake: Initially restricted or eliminated

Lactulose 4 Hours

Neomycin Decreases Enteric Bacteria and reduce ammonia production.

Flimazenil I/V

Pleconaril Antiviral therapy for Enteroviral Hepatitis in Neonates.

### ACUTE RENAL FAILURE..

Sudden reduction in renal function (oliguria / anuria with urine output < 1ml/kg/hr) with azotemia (raised s/creatinine)

#### Evaluation

- History of anuria, oliguria, hematuria, dysuria, throat / skin infection, drug intake, vomiting / diarrhea, burns
- Dehydration, puffy face, edema, ascites, effusion
- Vital signs T,P,R,BP.
- Visceromegaly : Liver, Kidney, bladder,
- signs of heart failure
- Funduscopy along with signs of CNS involvement

#### Investigation:

- CBC, ESR
- S/Na, K+, Urea, creatinine
- Ca, P, ASOT, C3, ABG
- Urine examination + c/s
- ABD USG esp KUB areas
- CXR, ECG for K+

#### Management

- Pass IV line
- Flow sheet:
- T, P, R, B.P, strict Intake / output record
- Conscious level assessment
- If anuria / shock, give 20 ml / kg N/saline or Ringer lactate rapidly over 1/2 hr, then assess.
- Watch for passage of urine
- Give 90 ml/kg N/Saline in 3 hrs, again review progress.
- In case of persistent oliguria / anuria and normal BR, give Furosemide IV 2 mg/kg. If no improvement, repeat furosemide 4 mg/kg within 2 hrs.
- If hypertension exists, give antihypertensives Nifedipine 0.2 – 0.5 mg / kg/dose or Labetolol / Captopril. If hypertensive encephalopathy, Sublingual
- Nifedipine or Apresoline 0.5—1.5 mg / kg / day
- Fluid is restricted in established renal failure with only 400 ml/M2/24 hr + Urine / Stool output.

- Give 300 Cal/M2/day as Glucose solution (10%)
- Watch for hyperkalemia (prolonged PR interval, ST wave changes, peak T-Wave, wide QRS). Manage with following measures :
  - Give Calcium Gluconate (10%) 1-2ml/kg slow, dilute with cardiac monitoring
  - Inj. NAHCO3 1-2 ml/kg
  - Nebulized Ventolin
  - Glucose 0.5-1 gm/kg followed by 0.1/unit insulin/kg
  - Kayexalate ion exchange resins like Na/Polystyrene sulfonate
  - Acidosis: Do ABG, calculate base deficit, give bicarb
  - Treat hyperphosphatemia with Aluminium hydroxide gel 1ml/kg/d orally with food.
  - Antibiotics. (give Penicillin in poststreptococcal AGN, treat UTI appropriately.)
- Peritoneal Dialysis indications :
  - Uncontrolled fluid overload, uncontrolled hyperkalemia, resistant metabolic acidosis, Encephalopathy, pericarditis, uncontrolled azotemia

Diabetic Ketoacidosis  
Criteria for diagnosis

BSR >250mg/dl	pH <7.25	HCO3 $\leq$ 15mg/dl
Severe DKA	pH <7.1	HCO3 $\leq$ 10mg/dl

Ist Hour

- 20ml per kg IV 0.9% sodium chloride sol
- Monitor conscious level
- Use flow sheet.
- Give initial dose of insulin as 0.1unit per kg
- Then start Insulin infusion (0.1unit/kg /hr) by adding required insulin in 100 ml burrette.

2-24 Hours

- Normal Saline infusion and insulin infusion (0.1 units per kg per hour) at rate of 85ml/kg + maintenance – initial Bolus
- Divide this fluid in three parts (one third in first 4 hours, one third in next 8 hours and rest in next 12 hours)
- Add 40 mEq KCl in 1000 ml of fluids
- use 5% D/W with half saline if glucose falls < 250 mg/dl
- Monitor vitals ½ Hourly for 2 Hrs then 1 Hourly for 24-Hours
- Blood sugar hourly
- Serum electrolytes 4 hourly

- Urinary Ketones 12 Hourly
- ABG (at admission and 12 hourly)
- Monitor Intake output record
- Give Bicarbonate IV only after ABG report ( pH <7.1 causing respiratory / cardiac disturbances. consult your seniors as well.
- Treat Infections with appropriate antibiotics.
- Change from IV to SQ insulin is done when patient is conscious and accepts oral feeds, has normal bicarbonate levels and BSR 180-240 mg/dl. Consult sliding scale. Monitor BSR 6 hourly before giving next dose of insulin.

### Sliding Scale

Blood Glucose	Regular Insulin
<60mg/dl	No insulin
60-90mg/dl	0.1 unit / kg
90-180mg/dl	0.2 unit / kg
180-270mg/dl	0.3 unit / kg
270-360mg/dl	0.4 unit / kg
>360	0.5 units / kg

### Subsequent Management of diabetic patient

- Aim at achieving the goals of adequate nutrition, active Healthy life and minimum long terms complications
- Calculate dose of insulin based on sliding scale preferably in combined form (30% regular+70% NPH) to be given in two doses (two third in morning and one third in evening) along with meals.

Diet : Give nutritionally balanced diet to promote growth in diabetic children comprising of Carbohydrates (50%), Proteins (20%) and Fats (30%)

### Education

- Educate the parents and child about nature of disease.
- Inform about types of Insulin, storage, filling of syringe and technique of administration.
- Dietary information
- Recognition and management of Hypoglycemia
- Monitoring of blood glucose
- Management during inter current illnesses

### Blood Sugar Monitoring

- Blood glucose estimation by Glucometer and HBA<sub>1c</sub> Monitoring
- Refer to Children Diabetic Clinic for regular visits.

### Bronchial Asthma

## Evaluation

H/O recurrent wheezing attacks and therapeutic response to beta agonists

## Investigations

Diagnosis is clinical in majority.

CX R, ABG where indicated, PEFR (after  $\frac{1}{2}$  years)

## Management of Acute Asthma Attack

- Oxygen Inhalation @ 2-3l/min with nasal cannula
- Nebulize with Salbutamol with oxygen (6 l/min), in a dose of 0.25 ml for age 2-12 months and 0.5 ml for age 1-10 years.
- Inj. hydrocortisone 5-10 mg per kg per dose 6 hourly
- Inj. Adrenaline 0.1ml SC (1:1000) SQ every 20 minutes
- Inj. Aminophylline as infusion 3-5 mg per kg per dose 6 hourly.

## Management of Status Asthmatics

- Admit in I.C.U
- Request for CBC, ABG, CXR,
- Vital sign monitoring including BP and sPO2.
- Oxygen inhalations @ 2-3 /minutes  
(Keep O2 saturation above 92%)
- I.V hydrocortisone 10mg per kg per dose 6 hourly
- Salbutamol Nebulization (dose as above)  $\frac{1}{2}$  hourly till response seen, then 1 hourly till breathlessness at rest settled; then reduce the frequency 4 hourly.
- Nebulize with ipratropium bromide (6 hourly) if patient is having tachycardia
- Aminophylline infusion @ 1 mg per kg per hour.
- Adrenaline SQ 0.1 ml 3 dose every 30 minutes.
- Adequate Hydration (1-1.5 times the maintenance)
- Frequent monitoring of conscious level, vital signs, O2 Saturation 1-2 hourly, hydration status and cardiac activity
- In resistant cases, isoprenaline infusion or magnesium sulphate (50% solution) 25-50 mg/kg/dose over 6 hours may be indicated after consultation.
- Mechanical Ventilation in case of respiratory failure in spite of all above measures.

## CONGESTIVE CARDIAC FAILURE..

## Evaluation

H/O breathing difficulty, tachycardia, hepatomegaly, crepitations at lung bases, cardiomegaly, edema and ascites.

## Investigations

CBC, ESR, Chest X-ray, ECG, Echocardiography, ABG, cardiac enzymes, serum electrolytes, ASOT, CRP and blood culture, urine examination, urea and creatinine where indicated.

## General Measures

- Admit
- Oxygen inhalations
- Prop up position 20-30°
- Maintain IV line
- Salt restriction
- Vitals signs 1 hourly for 24 hours (until patient becomes stable)
- Intake output records
- Fluid restrictions 2/3 rd of daily requirements
- Treat underlying infections with antibiotics

## Specific measures

- If HB < 12 g%, give packed cell transfusion 10 ml /kg slowly.
- Diuretics. Furosemide 2 mg/kg/dose I.V stat then 2 mg/kg/day in 2 divided doses  
Spironolactone 2-4 mg/kg/day in 2 divided dose
- Digoxin                    total dose = 0.04 mg/kg/day  
                                  Maintenance dose = 0.01 mg/kg/day  
                                  Rapid Digitalization total dose is 0.04 mg per kg 50% dose  
                                  given IV initially followed by 25% of total dose) after 6-8

and hours and 25% after 16 hours .

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- Dopamine 5 micro gram/kg/minutes to improve renal perfusion and
- Dobutamine 10-25 kg/minutes for inotropic effect.
- Vasodilators (captopril 1 -5 mg/kg/day) reduce after load by peripheral vasodilatation,

### COMMON POISONING..

#### Evaluation

H/O drug/poison ingestion, inhalation, contamination etc from parents or care giver  
Accidental or intentional,

Evidence from wound, odour, vomitus, opened bottle, containers.

#### Investigation

- CBC
- Urine.
- Blood glucose.
- LFTs.
- ABG when possible and necessary.
- Drug levels.
- Chemical analysis of poison in vomitus, gastric aspirate.
- X-ray Chest.
- ECG.

(where indicated)

#### Management

##### General principles

Report to CMO for medico legal purposes

##### *Dangerous features needing urgent action*

- Coma
- Convulsions
- Shock
- Bradypnea
- Sepsis
- Hypotension
- Arrhythmia
- Cyanosis

- *Coma*: Keep airway patent, give oxygen, ambu bagging may be needed
- *Convulsions*: IV diazepam (0.3mg/kg/dose, repeat 3 times)

- *Shock/hypotension*: raise foot end of the bed, push normal saline IV 20-30 ml/kg in 20 minutes.
- *Apnea/gasping or shallow breathing*: ambu bagging.
- *Arrhythmias*: for severe bradycardia (HR< 50/minute), give 0.01 mg/kg atropine IV stat, arrange ECG monitoring

Induction of vomiting: Induce vomiting in all cases brought within 6 hours of ingestion of poison unless contradicted:

- Comatose patient
- Corrosive poisoning
- Kerosene oil or petroleum ingestion.

#### *Methods*

1. Gagging: Make the child drink 1-3 glasses of plain water or milk. Do not give saline or warm water. Put index finger in the back of mouth/throat. Protect your finger from bite. Keep head low and face down.
2. Syrup of Ipecac (not the liquid extract) 10 ml followed by two glasses of water or milk. Shake the child up and down. If no vomiting, repeat syrup ipecac in 15-30 minutes. If still no vomiting, arrange for stomach wash.

#### *Gastric Lavage*

If emesis not achieved in 1/2 hr, do gastric lavage in all cases except in corrosive poisoning or when only small amount of kerosene oil taken.

#### *Antidotes*

- *Activated charcoal*: effective against all poisons except cyanide. 2 table spoonfuls in 8ozs of water.
- *Universal antidote*:
- Activated charcoal two parts
- Magnesium hydroxide one part
- Tannic acid one part
- Burnt toast, milk of magnesia in equal amounts may be used as alternative.
- Milk and white of egg especially in copper sulphate poisoning.
- KMnO<sub>4</sub> 1:10,000 solution for opium.
- Starch solution for iodine.
- Calcium lactate 10% in lavage solution for chlorinated hydrocarbons, fluorides and oxalates.
- Naloxone 0.1 mg/kg IV for opium and morphine poisoning. Repeat after every 3-5 minutes till response is achieved (pupillary dilation and improvement in respiration).

#### *Removal of poison from circulation*

- Ample fluids orally or IV and diuretics, forced diuresis
- Exchange transfusion.
- Peritoneal dialysis.
- Haemodialysis.

*Other supportive measures*

- Fluid and electrolyte balance.
- Correction of acid base status.
- Management of renal failure.
- Blood transfusion for anemia.
- Treat fever and infections.

General nursing care including care of bowel and bladder.

### RHEUMATIC FEVER

Rheumatic Fever is a clinical diagnosis and investigation play supportive role

#### DUICE – JONES CRITERIA

MAJOR MANIFESTATION	MINOR MANIFESTATION	SUPPORTIVE EVIDENCE
Polyarthritis	Fever (101-102°F)	
Carditis	Arthralgia	Raised ASO titre
Chorea	Previous H/O of R.F	+ve throat culture
Erythema marginatum	Raised ESR, CRP	
Subcutaneous nodules	Prolong PR interral	Recent scarlet fever

2 major “or” 1 major + 2 minor supported by evidence of streptococcal infection.

Investigation:-

- CBC, ESR
- CRP
- ASO titer
- Throat swab culture
- ECG
- CXR
- Echocardiogram

### TREATMENT

#### 1. BED REST

## 2. ANTIBIOTIC

Drug of choice – Benzyl penicillin

50000-100000 units/kg/day 1/v in four divided doses for 10 days

## 3. Anti Inflammatory

- Aspirin 120mg/kg/day to max 8gm/day for 2 weeks and then 60mg/kg/day until sign of activity subsides

- Corticosteroid

Prednisolone 1-2 mg/kg for 2-4 weeks in patients of serious carditis, taper steroids when signs of activity settles and replace it with aspirin as mentioned above.

## 4. Treat heart failure with

- Diuretic Inj. frusemide 1mg/kg /dose 12hourly followed by oral tab in bd doses, add spironolactone 2-5mg/kg /day in bd doses.
- Ace inhibitor captopril 1-5mg/kg/day in 3 divided doses
- Digoxin 10 micro gram/kg/day single oral dose

Subsequent management

- Inj benzathine pencillin 12 lac units 3 weekly up till the age of 20 years
- Prophylaxis for infective endocarditis should be given to all patients with rheumatic valvular heart diseases before dental procedures and surgery.

## HYPERTENSION

Investigation:-

- CBC
- Urine examination
- Measurement of S/E
- Blood urea and serum Creatinine
- CXR
- Abdominal USG
- Echocardiography
- Total cholesterol and HDL, LDL levels
- Abdominal angiography (vascular lesions of renal artery)
- Measurement of VMA in 24 hours urine

TREATMENT

Mild cases

Reduce salt intake

Reduce weight

↑ Physical activity

Severe cases:-

A single drug or a combination of two or more drugs can be used depending upon the situation, commonly used drugs are as follows,

ACE inhibitors (captopril)	0.1-0.3mg/dl/dose 8 hourly
B-Receptor blocker (propranolol)	0.025-0.1mg/kg 8 hourly
Calcium Channel Blockers (nifedipine)	0.2-0.5mg/kg
Diuretic (Frusemide)	1mg/kg/dose every 4-6 hourly
Vasodilators	
Hydralazine,	0.4-0.8 mg/kg every 2-4 hourly
Nitroprusside	0.5-0.8 mg/kg/min 1/v infusion

Centrally acting drug

(X-methyldopa)

(30mg/kg/24 in three divided doses)

Management of hypertensive crises

The blood pressure should be reduced 1/3rd of total planned reduction during 1st 6 hours and remaining over 48-72 hours. Emergency medication are sublingual nifedipine, 1/v ly hydralazine and 1/v infusion of sodium nitroprusside or 1/v frusemide.

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